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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/526,351	03/02/2005	Hisashi Watanabe	OPC-C539	8958

7590 02/21/2007

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EXAMINER	
LAM, CATHY FONG FONG	
ART UNIT	**PAPER NUMBER**
1775	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/21/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/526,351	WATANABE ET AL.	
	Examiner	Art Unit	
	Cathy Lam	1775	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 October 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) *9 and 15* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8 and 10-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

In view of the amendment and remarks filed on October 06, 2006, the pending claims continue to be unpatentable as following:

Information Disclosure Statement

1. The IDS filed on April 05, 2005 does not include a copy of the Foreign Patent Document 09-3114116 listed. Furthermore, two foreign patent documents submitted 05-110218 and 09-311446 were not listed on the PTOL 1449. Applicant is required to put these documents on a PTOL 1449 when respond to this office action.

Election/Restrictions

2. This application contains claims 9 and 12 are drawn to an invention nonelected with traverse in Paper filed on October 06, 2006. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Claim Objections

3. Claim 1 is objected to because of the following informalities: the word "decompsition" is believed to be a typographical error. Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. Claims 1-4, 6 and 13 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Nishinaka et al (US 6586081).

It is noted by the Examiner that some claims are drafted in a product by process format. It is the product itself which must be new and unobvious. Unless some

unexpected result is shown that occurs due to Applicant's specific process(es), different processing steps are not patentably distinguishing for claims to an article.

Nishinaka discloses a polyimide/metal laminate comprised of a polyimide film and a metal layer. The polyimide/metal laminate is particularly used for flexible printed wiring boards.

The polyimide film is obtained by a polyamic acid which is produced by at least one aromatic acid anhydride and at least one diamine (col 5 L 23-25). The metal layer is preferably a copper foil (col 1 L 40-45).

The copper foil is bonded to the polyimide film via an organotitanium compound (col 2 L 36-41). The copper foil has a thickness of 2000 Å (or 0.2 μm) is applied over onto the surface of the polyimide film. The titanium compound has the highest concentration on the surface of the polyimide film. The titanium compound is coated over the partly cured or partly dried polyamic acid film or polyimide film by gravure, spaying or knife coater (col 10 L 51-60). The examiner is taking the position that the organotitanium compound has a certain thickness over the polyimide film because gravure and knife coating indicates that the compound is highly viscous or it is in a paste form.

Although Nishinaka is silent about the water absorption coefficient and the linear expansion coefficient of the heat resistant polymer film, since the polyamic acid composition which serving as a polyimide precursor meets the disclosed polyimide material (i.e. 3,3',4,4'-benzophenone-tetracarboxylic acid dianhydride) (col 5 L 55), it is

inherent that Nishinaka's polyimide film possesses the same properties as claimed by the Applicant.

5. Claims 1-4, 7 and 11-12 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Yamamoto et al (US 6548180).

It is noted by the Examiner that some claims are drafted in a product by process format. It is the product itself which must be new and unobvious. Unless some unexpected result is shown that occurs due to Applicant's specific process(es), different processing steps are not patentably distinguishing for claims to an article.

Yamamoto discloses a polyimide/metal film laminate that is used for flexible printed circuit boards (col 1 L 30-32).

The polyimide film is an aromatic polyimide film, it has a linear thermal coefficient of 1.7×10^{-5} to 2.4×10^{-5} cm/cm/°C (col 3 L 24-28). The polyimide film is subjected to a discharge treatment on its surface and an adhesive layer before a metal film is applied (col 3 L 46-58 & col 4 L 15-23).

The surface of the polyimide film is treated with an organic phosphorus compound (or organometallic compound) which further includes titanium and/or silica (i.e. silicon oxide) particles (col 5 L 8-16). The organic metallic compound is then formed a doped solution film (col 5 L 20-22). The surface is then further treated with an aminosilane coupling agent (col 5 L 28-30). An adhesive such as a polyimide-siloxane is coated onto the treated surface (col 6 L 18).

The metal film which can composed of two metal layers, is made of copper and has a total thickness from 1 to 20 μm (col 6 L 61-67).

6. Claims 1-4 and 14 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Ozawa et al (US 6808818).

Ozawa discloses a polyimide/metal laminate which is useful for flexible printed circuit boards.

The polyimide is a composite polyimide film comprised of a fusible polyimide layer and a polyimide substrate (col 2 L 23-25). A copper film is formed onto the fusible polyimide layer (col 5 L 52-53).

The fusible polyimide layer is a doped solution comprised of an organic metallic compound such as organic aluminum compound (col 4 L 62-67 & col 5 L 1-3).

The composite polyimide film has a linear expansion coefficient of 1.5×10^{-5} to 3.0×10^{-5} cm/cm/°C (col 5 L 38-41).

The examiner is taking the position that since the polyimide film meets the present invention inherently it has the same water absorption coefficient.

Claim Rejections - 35 USC § 103

7. Claims 1-8 and 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishinaka et al (US 6586081) or Yamamoto et al (US 6548180) or Ozawa et al (US 6808818).

All of the prior art teach a polyimide/metal film laminate that is useful for flexible printed circuit boards. The polyimide films in all of the three prior art are aromatic polyimide films and the metal films are copper foils.

All of the prior art teach using a bonding promotion material such as an organic metallic compound and/or a resin adhesive layer for better bonding between the polyimide film and the copper foil.

The prior art however do not teach the resin adhesive layer is formed onto the polyimide film before applying the organic metallic compound. The prior art also are silent about the cooper foils were patterned to form a circuit.

In view of the prior art teachings, one skill in the art would apply a resin adhesive onto the polyimide film before or after the organic metallic compound treatment because both the adhesive and the organic metallic compound are fluidic materials which would mixed or fused together to give a stronger bonding material.

Furthermore, it would have been obvious that the prior art laminates were patterned to form a circuit since they are all useful for printed circuit boards.

Response to Arguments

8. Applicant's arguments filed on October 06, 2006 have been fully considered but they are not persuasive. Applicant disagrees the art rejections and raises the following issues:

A. Neither Nishinaka nor Yamamoto teaches the organic metallic compound being a layer. Applicant contends that the organic metallic compounds in the prior art are solvent solutions that were absorbed into the polyimide film.

In respond to the above issues:

A. The purpose of the organic metallic compound is to enhance the bondage between the metallic foil and the polyimide film. The organic metallic compounds *might*

be a solvent solution, but in order for bonding to occur, a layer of the organic metallic compound with **some thickness** of **must exist**.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cathy Lam whose telephone number is (571) 272-1538. The examiner can normally be reached on 9am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on (571) 272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Cathy Lam
Primary Examiner
Art Unit 1775

cfl
Feb. 15, 2007